

CLAIMS

1. A continuously variable transmission comprising a transmission input, a transmission output, a continuously variable transmission unit ("variator") which provides a continuously variable variator ratio, and gearing constructed and arranged to couple the variator between the transmission input and the transmission output in either of a low regime and a high regime, so that the transmission output is drivable from the transmission input at a transmission ratio which is related to the variator ratio, the relationship between the variator ratio and the transmission ratio being different in the two regimes, the gearing incorporating first hydraulically actuated clutch means for engaging and disengaging low regime and second hydraulically actuated clutch means for engaging and disengaging high regime and being such as to provide a synchronous ratio at which a change between low and high regimes at constant variator ratio produces no change in transmission ratio, and the transmission being provided with hydraulics incorporating a shift valve which controls application of hydraulic pressures to the first and second clutch means, so that a change in state of the shift valve causes one of the clutch means to change from engaged to disengaged and the other of the clutch means to change from disengaged to engaged, thereby causing the transmission to change from one regime to the other.

2. A continuously variable transmission as claimed in claim 1 wherein the shift valve is a two state valve which causes the transmission to adopt low regime when in one state and high regime when in the other state.

3. A continuously variable transmission as claimed in claim 1 or claim 2 wherein the engagement of one clutch means and the disengagement of the other take

place concurrently.

4. A continuously variable transmission as claimed in any preceding claim wherein the shift valve is an electrically controlled valve which applies a hydraulic control pressure to a clutch control valve which in turn controls application of hydraulic pressures to the first and second clutch means.

5. A continuously variable transmission as claimed in claim 4 wherein the clutch control valve has two states in one of which it connects the first clutch means to high pressure and exhausts the second clutch means and in the other of which it connects the second clutch means to high pressure and exhausts the first clutch means.

6. A continuously variable transmission as claimed in any preceding claim wherein the variator is of torque controlled type, comprising at least one hydraulic actuator whose force determines variator reaction torque, the shift valve controlling application of hydraulic pressure to the actuator so that a change in state of the shift valve reverses the direction of action of the actuator and so reverses the variator reaction torque.

7. A continuously variable transmission as claimed in claim 6 wherein a change in state of the shift valve also causes a change in the magnitude of the actuator force.

8. A continuously variable transmission as claimed in claim 7 comprising means for providing first and second adjustable variator control pressures, and a switching valve having a first state, in which it applies the first variator control pressure to a first side of the hydraulic actuator, and a second state, in which it applies

the second variator control pressure to a second side of the hydraulic actuator, so that a change in state of the switching valve produces a change in magnitude and direction of the actuator's force.

9. A continuously variable transmission as claimed in claim 8 wherein the switching valve is separately formed from the shift valve and a hydraulic output from the shift valve controls the state of the switching valve.

10. A continuously variable transmission as claimed in claim 8 wherein the first variator control pressure is supplied to a reducing valve whose output pressure forms the second variator control pressure.

11. A continuously variable transmission as claimed in claim 10 wherein the reducing valve maintains a substantially constant ratio between the first and second control pressures.

12. A continuously variable transmission as claimed in any of claims 8 to 11 further comprising a crossover valve connected between the switching valve and the hydraulic actuator so that a change in state of the crossover valve reverses the direction of action of the hydraulic actuator without regime change.

13. A continuously variable transmission as claimed in claim 12 wherein the crossover valve is electrically controlled independently of the shift valve.

14 A continuously variable transmission substantially as herein described with reference to, and as illustrated in, the accompanying drawings.